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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,173	07/13/2001	Kwang-Leong Choy	674556-2001	1580

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EXAMINER	
PARKER, FREDERICK JOHN	
ART UNIT	PAPER NUMBER
1762	11

DATE MAILED: 05/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/909,173	Applicant(s)
	Examiner	Group Art Unit

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE — 3 — MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 4/21/03.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-65 is/are pending in the application.

Of the above claim(s) 41-65 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-27+ 29-40 is/are rejected.

☒ Claim(s) 28 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The drawing(s) filed on 7/13/01 is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☒ None of the:

☒ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*C rtified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Pat nt Application, PTO-152

☐ Notice of Draftsperson's Pat nt Drawing Revi w, PTO-948

☐ Oth r _____

Office Action Summary

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of claims 1-40 in Paper No. 10 is acknowledged. The traversal is on the ground(s) that (1) searching all the inventions would not constitute undue burden, and (2) the restriction is "contrary to public policy". This is not found persuasive because, regrading argument (1) the examination of plural and distinct inventions does pose an undue burden far and beyond the burden of search. The burden to the Examiner further extends to the PATENTABILITY ISSUES associated with, and evolving as a result of, searching for additional inventions. Issues related to, for example, a method or apparatus are frequently very different from those related to an article. Thus issues related to determination of patentability may require complex evidence to resolve critical issues which would be unfamiliar or dissimilar to those in an unrelated art area. Hence, the examination of claims of separate inventions represents an undue and serious burden on the Examiner both because of (1) excessive and non-overlapping search, and (2) the evolution of patentability issues related to searching multiple and distinct inventions. Hence. Applicants' arguments are not deemed to be persuasive. Regarding argument (2) that

restriction is contrary to public policy because the cost of prosecuting and maintaining fees for multiple inventions is an inconvenience for the public, while the Examiner is sympathetic to these issues, this is not persuasive because the Examiner is simply following the rules and regulations set forth by the Office for examination. The Examiner followed the requirements for demonstrating independent and distinct inventions, so that restriction was proper. The issue that the public "will not know whether or not....(to) file a divisional application to the remaining subject matter" is a well-defined issue: plural inventions require plural/ divisional applications, and the issue of filing divisional applications is well-known to the Applicants' attorney. Thus, there should be no issue that the Applicants will be unable to know whether or not to file a divisional, or whether they can practice the invention without infringement, given the fact they maintain highly competent legal representation. **The requirement is still deemed proper and is therefore made FINAL.**.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in GB on 1/15/99. It is noted, however, that applicant has not filed a certified copy of the application as required by 35 U.S.C. 119(b).

Drawings

3. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

4. The drawings are objected to because there is no labeled Figure 9 on page 5/7 (hence amendment of paper 6A related to the figure cannot be entered). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The following guidelines illustrate the preferred layout and content for patent applications. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

The following order or arrangement is preferred in framing the specification and, except for the reference to the drawings, each of the lettered items should appear in upper case, without underling or bold type, as section headings. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) Title of the Invention.

(b) Cross-Reference to Related Applications.

© Statement Regarding Federally Sponsored Research or Development.

(d) Reference to a "Sequence Listing," a table, or a computer program listing appendix submitted on compact disc (see 37 CFR 1.52(e)(5)).

(e) Background of the Invention.

1. Field of the Invention.

2. Description of the Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(f) Brief Summary of the Invention.

(g) Brief Description of the Several Views of the Drawing(s).

(h) Detailed Description of the Invention.

(I) Claim or Claims (commencing on a separate sheet).

(j) Abstract of the Disclosure (commencing on a separate sheet).

(k) Drawings.

(l) Sequence Listing, if on paper (see 37 CFR 1.821-1.825).

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

7. The incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973). See top, page 1.

8. The use of the trademark Ludox has been noted in this application page 23. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

9. The disclosure is objected to because of the following informalities: (1) please note that amendments to the specification of paper 7B (7/30/02) were NOT ENTERED because they were duplicates of paper 6A (5/9/02).(2) page 11, lines 13-14 and page 12, 14-15 both describe figure 1, two descriptions appearing to be superfluous. (3) the amendment of paper 6A of 5/9/02 on page 4, bottom through page 12 is confusing because they appear to be a listing of claims, but claims are separately and properly listed under the heading "In The Claims". The meaning of these first "claims" in the specification is unclear since they will become obsolete by amendment and restriction/ claim cancellation, and further are also basically listed again on pages 2-9 of the specification. (4) The Examiner recommends a substitute specification to clarify and simplify the intended content of the specification, in view of the large number of amendments and objections to the specification. Appropriate correction is required.

Claim Objections

10. Claim 28 is objected to under 37 CFR 1.75© as being in improper form because a multiple dependent claim cannot refer to two sets of claims to different features. Claim 28 appears unable to depend on claim 4. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 112

11.The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 3,4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 3: "deposition" lacks proper antecedent basis.

- Claim 4: "thermal environment" lacks proper antecedent basis.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1-12,17-20,24,35 are rejected under 35 U.S.C. 102(b) as being anticipated by Myers US 3436257.

Myers teaches to form homogenous, uniform coatings on substrates, in which a metal salt/ dispersion leaving nozzle port 36 is atomized by contacting high pressure air flow from conduit 38 and charged by nozzle body 26, where the fine, charged droplets leave the end of the nozzle (fig. 1-2, col. 2, 33-71), and are directed toward an oppositely charged stationary workpiece 22 heated by element 16 to convert the solution to a solid coating film. The temperature range of the substrate is 220-850 C (col. 7, 56-58) which is "less than 1050 C" per claim 2. Solvents used may be water or organic solvents per claims 5-6. A decreasing temperature from the heated substrate directionally towards the nozzle must inherently occur per claim 4. The nozzle serves as electrode (col. 3, 1-14) per claim 12.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. Claims 29,30,33,34,36,38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Myers.

Myers is cited for the same reasons discussed above, which are incorporated herein. Specifics of conventional process parameters are not disclosed.

Since Myers recognizes that coating thicknesses are variable (col. 7, 61-69), the flow rate of coating solution is a conventional variable known to one of ordinary skill known for forming coatings of specific thicknesses, and hence claims 29-30 merely represent optimization of a conventional spray coating parameter which would have been apparent to one of ordinary skill. As to claim 33, Myers teaches a voltage potential of 8-60 KV, overlapping the range of claim 33. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made if the overlapping portion of the disclosed by the reference were selected because overlapping ranges have been held to be a prima facie case of obviousness, see In re Wortheim 191 USPQ 90. As to claims 34,36 optimizing distance between nozzle and substrate to maximize amount of coating material being applied and minimize over-spray would have been apparent to one of ordinary skill in the art. As to claim 38, although not explicitly stated, it would have been apparent the method is performed at atmospheric pressure. However, carrying out the process at any pressure or atmosphere necessary to cause a film reaction would have been an obvious process parameter within the purview of one skilled in the art to provide a desired film composition per claims 39-40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Myers by optimizing and controlling conventional process parameters such as flow rate, voltage potential, pressures, and nozzle-substrate distance to form coatings of a desired thickness, uniformity, composition, and coverage.

18. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Myers in view of Hirose US 5298277.

Myers is cited for the same reasons discussed above, which are incorporated herein. Rotating, tilting and/ or translating substrate relative to nozzle are not disclosed.

Hirose teaches an electrostatic spray coating process in which a spray gun is moved relative to a moving substrate, which permits end portions of the substrate to be coating resulting in greater coating uniformity, resulting in improved coating quality. The teachings would have reasonably suggested the use of the concept of moving substrate and spray nozzle unit in a related coating method, such as that of Myers, to derive the recognized benefits of greater coating uniformity and quality.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Myers by moving/ translating a

sprayer relative to a substrate to provide the recognized benefits of greater coating uniformity and quality.

19. Claims 13-16,19, 21-23,25-27,32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Myers in view of Kim US 5344676.

Myers is cited for the same reasons discussed above, which are incorporated herein. Use of an elongate electrode in the nozzle is not disclosed.

Kim et al teaches a method for applying nanodrops to a substrate to form a coating. A precursor material 9 comprising a base material (or plural base materials for a binary, ternary, etc product composition) in a suitable solvent is sprayed from a capillary tube 10 containing a needle electrode 14 connected to a high voltage source. The use of a perforated member to maintain the needle electrode in a stationary position would have been a design choice of the skilled artisan tp provide a means of stability to maintain the integrity of the electrode needle and minimize movement to prevent variations in charging characteristics. The sprayed liquid droplets are constantly electrostatically charged with a negative or positive polarity. The entire apparatus is contained within chamber 22 which may be connected to an inert or reactive gas via port 28. The target area is heated by heater 34 to promote reactions of precursor

materials to form films on a substrate. Suction pump 50 removes excess gases, which requires at least locally sub-atmospheric pressures and would draw gas towards the substrate, per claims 25-27.

The apparatus comprises tube 10, within which is located needle electrode 14 which causes the precursor liquid to be continuously charged and formed into nanodrops which provides the benefits of more even dispersion of deposited particles and deposition of thinner films (col. 4, 16-21). The needle electrode is recognized in Kim to extend below the lower end of the nozzle. However, in Fig. 1-2 of Myers, the charging electrode is the nozzle barrel 26 itself, causing charging of the atomized particles BEFORE and UPSTREAM of the nozzle opening at the end of the assembly. Kim et al teaches needle electrodes cause continuous charging and formation of nanodrops. Given this motivation, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the process of Myers by incorporating needle electrode/s as the source of charging as taught by Kim et al in place of using the barrel itself as the electrode, and further placing one or more electrodes upstream of the orifice and adjacent fluid source 36 to provide the recognized benefits of more even dispersion of coating particles and formation of thinner films.

20. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Myers in view of Choy et al WO 97/21848.

Myers is cited for the same reasons discussed above, which are incorporated herein. Use of a nozzle unit directed upward is not disclosed.

Choy et al discloses a related electrostatically assisted spray deposition process in which fine-size charged particles of a precursor solution are propelled at a substrate to form a film onto a heated substrate. As shown in figures 1 and 10, etc, the sprayer is vertical so the aerosol flow is directed upwards at the substrate above the sprayer, and the process successfully forms coating films in an ambient or reactive atmosphere (page 2, 10-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Myers by changing the orientation of the sprayer and substrate so the precursor solution is propelled upwardly towards the substrate because of the expectation of forming simple or multi component films.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred J. Parker whose telephone number is (703) 308-3474.

Fred J. Parker

FRED J. PARKER
PRIMARY EXAMINER

May 15, 2003

9-909173